Powerful and Realistic Tools for Marketing Decision Making—Paired Trade-Off Analysis

Many marketing decisions require complex decision making processes which incorporate several data points from various sources. Depending on the type of decision you need to make, some statistical techniques will be more useful than others. In this series of white papers we will explore three different trade-off techniques frequently used for different marketing decisions. In our first white paper, we explored Discrete Choice Modeling; in the second paper, we discussed Full Profile Conjoint Analysis; the last presents Paired Trade-Off Analysis.

Like Discrete Choice Modeling and Full Profile Conjoint Analysis, *Paired Trade-Off Analysis* is a trade-off and simulation technique useful for studying which attributes of a particular product or service are most important to consumers. The technique has each of these qualities:

> The ability to discriminate among product or service attributes so that marketers gain clear direction for allocating their resources toward the consumer benefits most likely to be appealing and generate profits

> The ability to target the appropriate market segments in the research process

> The flexibility to test the relative importance of a large number of factors and different kinds of factors

> Enough simplicity in the research process so that attribute importance can be measured among consumers, even in the most unsophisticated market segments

> User-friendly results so that marketing applications are clear and actionable

Some other trade-off techniques, like Discrete Choice Modeling and Full Profile Conjoint are able to discriminate among many different attributes and yield very useful results in many different situations; however, these techniques can quickly become expensive and too complex for some target markets. In these situations, Paired Trade-Off Analysis may yield results which are just as robust as the more expensive methods but with the simplicity and cost-effectiveness needed in the specific marketing situation being explored.

One of the greatest benefits of Paired Trade-Off Analysis is its *flexibility*. This technique can be used for comparative assessments of almost anything that can be expressed as an object, idea, phrase, or attribute. The methodology simply requires respondents to make decisions about their preferences between successive pairs of alternatives. Where most conjoint techniques are limited in the number of factors that can be tested in a practical sense, Paired Trade-Off Analysis can handle twenty or more attributes with ease. This flexibility is particularly important to the marketer who needs to identify the driving factors in the sales of a product or service with a large number of potential or actual features or attributes.
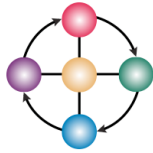
The process is simple: the respondent simply chooses which alternative they prefer from each of a series of factor pairs. For each pair, the respondent can make only one choice, option A or option B. For example, in a study with the objective of determining the relative importance of computer features, the respondent may be asked to indicate his or her preferences out of each of the following pairs:

| Sample Paired Trade-Off Analysis List for Hypothetical Computer Features Study		
Hard drive space "A"	<-----Or----->	Processing speed "B"
Processor type "C"	<-----Or----->	Cost "D"
Cost "E"	<-----Or----->	Pre-Installed software package "F"
Graphics card type "G"	<-----Or----->	RAM speed "H"
And so on…		

The number of pairs seen by each respondent is determined by the number of factors to be tested. All possible pairs are exposed to respondents across the entire sample. Although the pairings may not always appear to trade off strictly comparable features (e.g., types of graphics cards versus pre-installed software), the respondent is indicating which attribute is more appealing in their purchase decision when they make their choice.

If the number of attributes is high, the research design may incorporate a *fractionalized sample strategy*. In fractionalized design, the number of product/service attributes in the overall design remains the same and is structured to fully answer the research objectives of the study. However, *the number of attribute pairs any individual sees is a statistically derived subset of the total* number of possible pairs of attributes. This strategy does involve larger sample sizes to make sure that each attribute pair is seen by a statistically appropriate number of respondents. However, it also helps to ensure that the Paired Trade-Off Analysis design and data generated from it completely explore the attributes necessary without compromising data collection efforts through respondent fatigue.

Utility Statistics

The results of Paired Trade-Off Analysis are typically reported as *utility statistics* or utilities, which illustrate the relative importance, worth, or appeal of each attribute tested. These statistics are ratio-scaled so they express not only the rank order of the attributes but also the degree to which any factor exceeds any other in importance, worth, or appeal. This allows client to make *head-to-head comparisons* at a glance among all the attributes being explored and identify which product or service features and benefits are most appealing to the customer in the sense of relative importance. For example, in the computer example above, if the results show hard drive space "A" with a utility of 10 and graphics card type "G" with a utility of 5, the hard drive space is twice as likely as the graphics card to drive the purchase decision among typical consumers.

Paired Trade-Off Analysis also offers flexibility in its post-research applications. While the examples discussed in this white paper focus on identifying the relative importance of several attributes for a particular product or service, these results can also be applied to
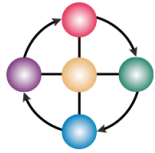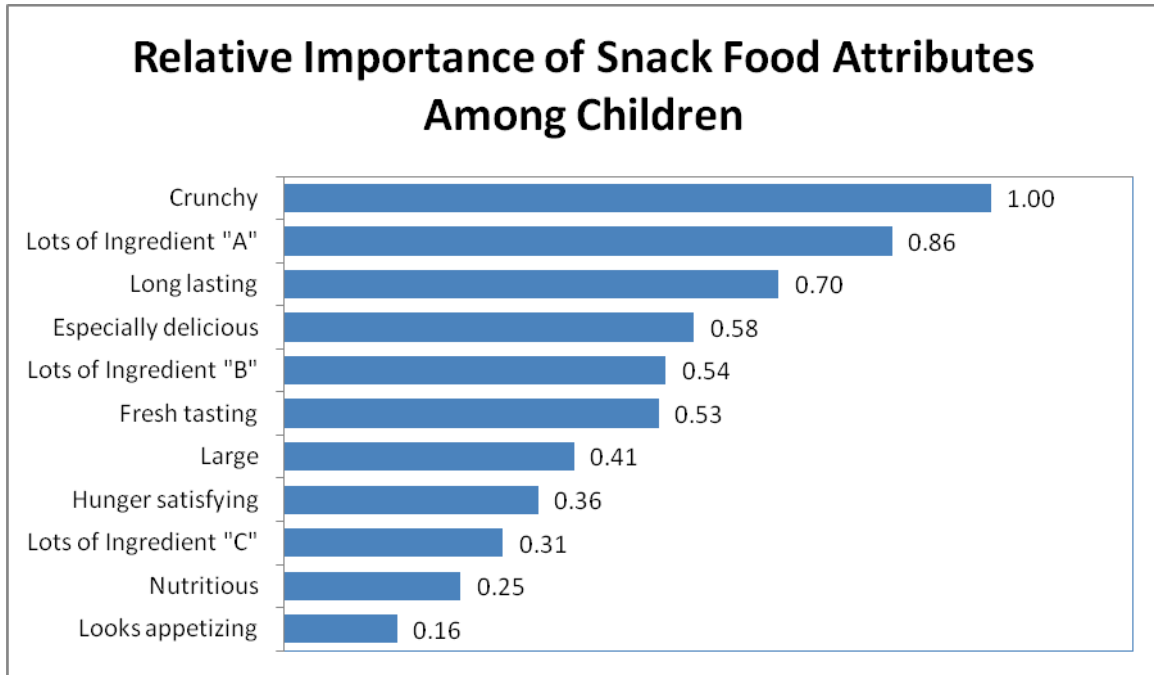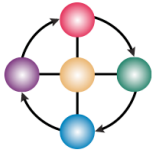
segmentation analysis to partition the marketplace into groups based on the relative appeal of the different attributes. This is because Paired Trade-Off Analysis importance scores are estimated at the individual respondent level. As a result, respondents can be grouped into market segments based on the attributes they consider importance. In our hypothetical computer example, respondents who place high importance on graphics cards and processing speed may end up in a segment of "Computer Gamers" while those for whom hard disk space and pre-installed software are more important may best be described as "Business Users."

Using Paired Trade-Off Analysis with Difficult Populations like Children

Consider the following example. A marketer of children's snack foods wants to determine which attributes of a new snack are most appealing to kids. While Discrete Choice Modeling or Full-Profile Conjoint may be more appropriate techniques for an adult population which has had more life experience making decisions in the marketplace, these techniques are too complex for less experienced markets like children. This is not to say that kids can't express preferences; anyone who knows children knows that *kids can definitely tell you which is better*: Star Trek or Star Wars, Play Station or Xbox, baseball or football, cake-like brownies or fudge-like brownies. They simply indicate their preferences more easily using a "Choice A vs. Choice B" scenario rather than the more complex rating scales and market simulations used for more experienced adult populations.

To apply these concepts of design simplicity and opportunities for discrimination to our study of snack foods for children, we designed a straight-forward Paired Trade-Off Analysis. In this design, the child was asked to make simple choices, (Which is better?), that correspond to the kinds of choices he or she makes every day. At the same time, the child was forced to discriminate by choosing only one alternative over the other in each pair.
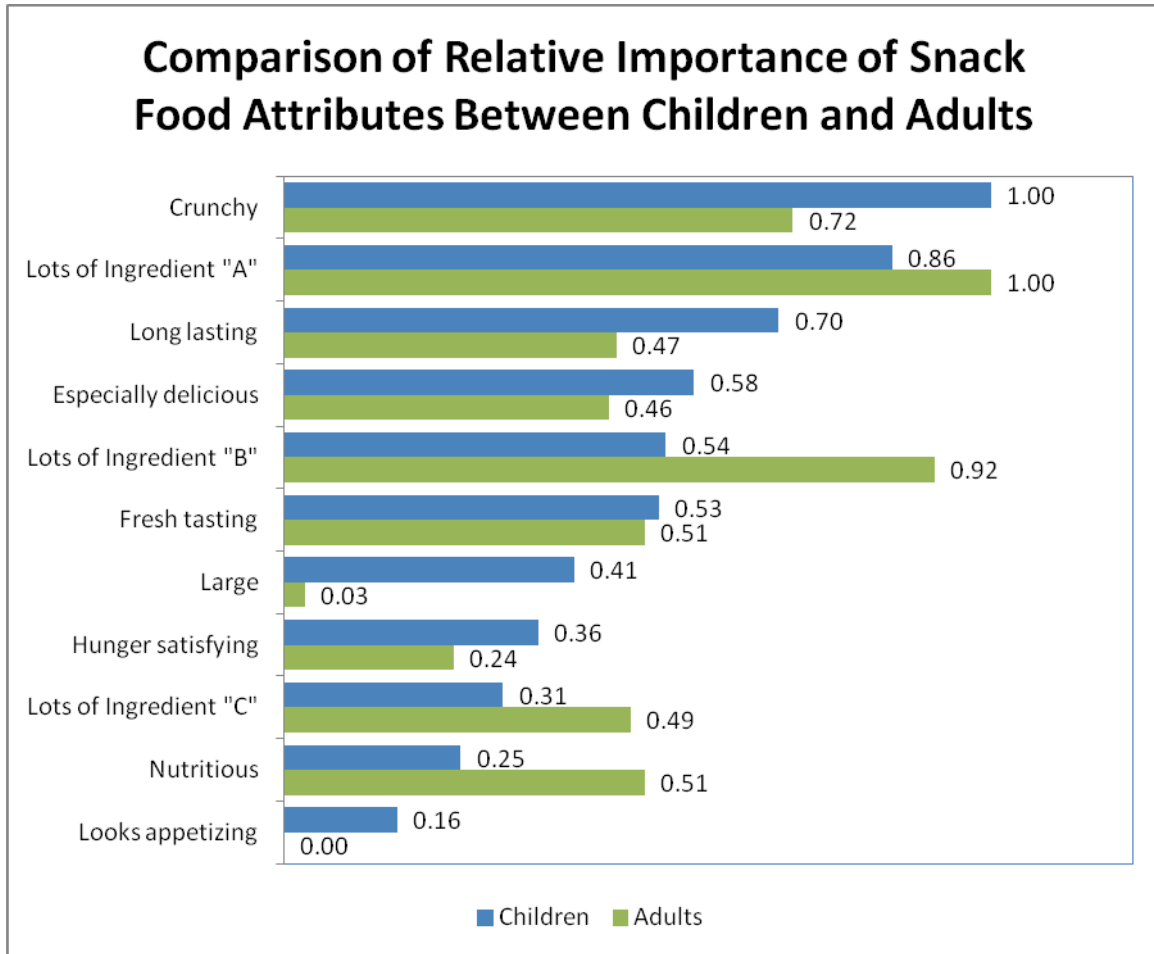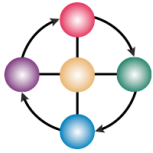
This design asked children to choose which they liked better, a snack with Attribute "A" or a snack with Attribute "B." The chart below shows the relative importance of each of the eleven snack attributes taken from the results of this Paired Trade-Off Analysis task. The numbers represent the "utility" of each attribute or its importance relative to the other attributes. These utilities relate degree of importance so that "fresh tasting," for example, is about half as important to kids as "crunchy" while "nutritious" is about half as important as "fresh tasting" and one-quarter as important as "crunchy."

Relative Importance of Snack Food Attributes Among Children

| Attribute	Value
Crunchy	1.00
Lots of Ingredient "A"	0.86
Long lasting	0.70
Especially delicious	0.58
Lots of Ingredient "B"	0.54
Fresh tasting	0.53
Large	0.41
Hunger satisfying	0.36
Lots of Ingredient "C"	0.31
Nutritious	0.25
Looks appetizing	0.16

Comparing Paired Trade-Off Analysis Results with Results from Other Techniques (comparisons between populations)

Children and adults don't always agree on snacks, or on many other product categories for that matter. Paired Trade-Off Analysis allows for direct and meaningful comparisons between studies with different populations in terms of what is important in a product. Even though more complex techniques like Conjoint or Discrete Choice modeling are more appropriate with more experienced consumers, results from these techniques can still be compared to results from Paired Trade-Off Analysis because they both yield utilities scores which can be compared directly to one another and yield important insights into the marketplace.

The chart below is from the same snack food study and incorporates the results from the adult audience, which were gathered using Full Profile Conjoint Analysis. Attributes are sorted in the same order as in the chart showing results from just the kids and gaps are readily apparent. Comparing results on the relative importance of "Lots of Ingredient B," we see that among adults this attribute is twice as importance as it is among the kids. The attribute of "Nutritious" is also much more important to adults as it is to the kids, which makes intuitive sense.

Comparison of Relative Importance of Snack Food Attributes Between Children and Adults

Attribute	Children	Adults
Crunchy	1.00	0.72
Lots of Ingredient "A"	0.86	1.00
Long lasting	0.70	0.47
Especially delicious	0.58	0.46
Lots of Ingredient "B"	0.54	0.92
Fresh tasting	0.53	0.51
Large	0.41	0.03
Hunger satisfying	0.36	0.24
Lots of Ingredient "C"	0.31	0.49
Nutritious	0.25	0.51
Looks appetizing	0.16	0.00

■ Children ■ Adults

The ability to compare results from these different populations is critical to marketers. While children no doubt influence decisions about snack products (and other products as well), adults are most frequently the decision makers and gatekeepers, particularly regarding product attributes which are of greatest importance to them. Product benefits and marketing messages need to be carefully crafted to appeal to both segments and having quantifiable information helps to guide these decisions.
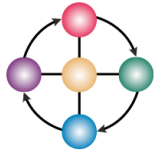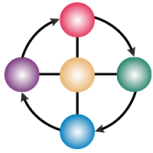
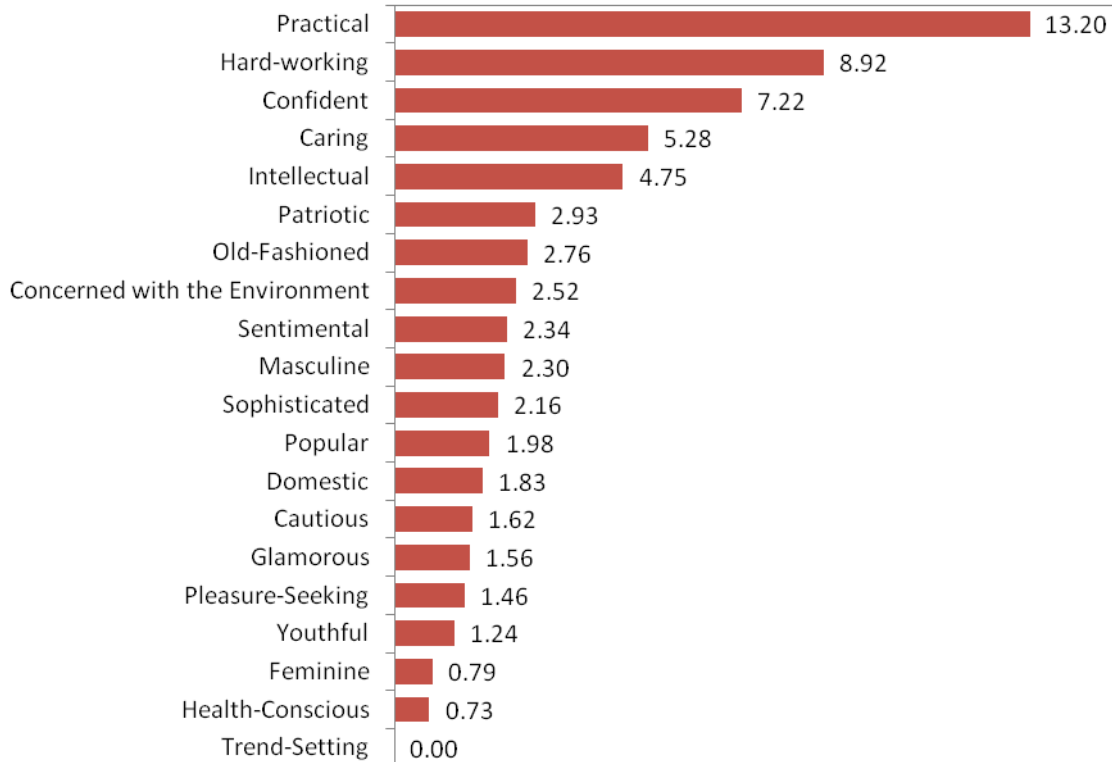## *Using Paired Trade-Off Analysis to Measure Complex Ideas like Brand Perception*

Paired Trade-Off Analysis is not simply a tool for less sophisticated audiences like children. It can also be used quite easily in online studies to *measure complex ideas like brand perception*. The technique's simplicity and ability to discriminate among pairs of characteristics help to make this possible.

Most techniques measuring brand perceptions are relatively insensitive. Respondents tend to give high scores to most attributes for brands they like and low scores to most attributes for brands they dislike. All this tells us is whether a brand is liked or not based on these types of ratings. What is needed is more descriptive information about *what characteristics are actually associated with the brand*. The need to identify the brand characteristics most closely associated with the brands respondents tend to like (and dislike) from a pre-determined list of brand traits suggested a trade-off methodology that would allow marketers to make distinctions among the brands based on their brand personality characteristics. Paired Trade-Off Analysis is particularly well-suited for these types of inquiries.

Drawing on a subset of data from an existing study, the chart below shows the types of brand personality traits which are most likely to be associated with brands viewed as high quality among a subset of the population identified as "Conformists."

Association of Attributes with Brands of High Quality (among Conformists)

Attribute	Value
Practical	13.20
Hard-working	8.92
Confident	7.22
Caring	5.28
Intellectual	4.75
Patriotic	2.93
Old-Fashioned	2.76
Concerned with the Environment	2.52
Sentimental	2.34
Masculine	2.30
Sophisticated	2.16
Popular	1.98
Domestic	1.83
Cautious	1.62
Glamorous	1.56
Pleasure-Seeking	1.46
Youthful	1.24
Feminine	0.79
Health-Conscious	0.73
Trend-Setting	0.00

In this study, respondents were asked first to rate several brands based on overall perceptions of quality. Then respondents were asked to select which types of people would "especially like" one of his or her highest rated brands, using a list of brand characteristics determined before-hand. For example, suppose Cabela's Outfitters was one of a consumer's favorite brands. That person would be asked which of two kinds of people, e.g., a practical person or a trend-setting person would be more apt to especially like shopping at a Cabela's store. Each respondent was asked to make these choices for 20 pairs of person types. The respondent was also asked to make the same choices for one of his or her lowest rated brands.

Looking at the results in aggregate, marketers can discover the traits that have higher utilities in describing brands with high levels of perception of quality as well as those traits that are more associated with brands of lower levels of perceived quality. These characteristics can then be used to develop and enhance the personality of the brand and craft appropriate marketing messages to build brand quality and brand equity among target populations, both in aggregate and by market segment.
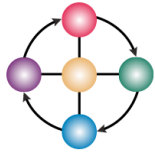
In our example study, we were able to identify the brand characteristics that were most likely to be associated with high quality brands and were able to segment these results by the personality characteristics of the respondents. In the chart above, we show that for the segment of the market that can be described as "Conformist," the brand characteristics most closely associated with high quality brands are the attributes of practicality, hard-working, confident, and caring. Brands associated with these qualities are likely to be viewed as high quality brands among the segment of the market identified as "Conformist."
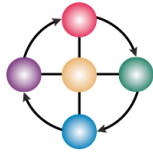
What this means for marketers in this example is as follows: If the target market comprises individuals most likely to be described as conformist, these individuals are most likely to view high quality brands has having qualities that are high on this list. Including these brand personality characteristics in marketing communications to these potential consumers may increase the likelihood that the brand will be perceived as high quality among these consumers. This, in turn, may increase measures of brand equity among this segment and may be associated with other customer retention measures likely customer loyalty, willingness to repurchase, willingness to recommend, and other consumer behaviors of interest to marketers.

Using a simple and straight-forward technique to make these kinds of discriminations in customers' perceptions is part of what makes Paired Trade-Off Analysis so useful in many different market research analyses.

In Conclusion…

In short, Paired Trade-Off Analysis is a valuable tool in both the B2B and B2C spaces to help discover the importance to consumers of suggested benefits and features to a product or service offering. Not only is the technique simple to execute, it yields clearly understood information about how different market segments discriminate among many product and service attributes. It can be an important tool not only in segmenting market audiences, but also provide valuable comparisons with results from other techniques more appropriate to different populations. These data are very useful in making crucial business decisions about product and service design attributes. It has the added advantage of being straightforward to design, program, implement, and interpret. These are significant advantages in determining which statistical tools are most appropriate for answering the needs of your clients in the current challenging business environment.

About Customer Lifecycle, LLC

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Customer Lifecycle is a global research-based consultancy committed to helping our clients avoid costly mistakes by focusing on thorough front-end planning, appropriate support for research execution, and in-depth deployment consulting and implementation at the back end. Outcomes are rigorous and balanced customer-focused performance metrics, improved financial results, and a superior total customer experience. Its mission is to provide companies with insight into their industries and staff by deploying sophisticated analyses to answer tough business questions, and intelligence that clients can act on with confidence, thereby offering an edge in understanding customer choice, engagement, loyalty and advocacy.

Each stage in the customer lifecycle—acquisition, service, growth, retention—has its own unique challenges and solutions to address specific business issues. Customer Lifecycle helps both B2B and B2C focused organizations plan and conduct research to accurately identify and measure customer requirements for satisfaction, loyalty, and retention at every stage of the relationship and to deploy and integrate customer requirements for performance into the processes and internal performance metrics of the organization.

About the Author

Julie Margolis Worwa, Senior Research Director at Customer Lifecycle. is an accomplished and forward-thinking market research professional with over 25 years of experience in the marketing research industry. She has expertise in all facets of the research process from questionnaire design and respondent interviewing to data analysis and report presentation. She is highly skilled in client relations, research design, project management, multivariate analysis, delivery of findings, team building and leadership.

Julie is experienced in a wide variety of research designs and analytical techniques involving multivariate statistical analysis such as regression analysis, factor analysis, cluster analysis and importance analysis. She excels in producing comprehensible automated report designs, insightful written reports, and predictive/analytical models using the Microsoft Office Suite and VBA.

Julie is the author of several white papers for Customer Lifecycle which have been published in multiple market research professional journals. Topics of her articles have included predictive segmentation, choice-based analytical techniques such as DCM and Full-Profile Conjoint analysis, and other strategic analysis tools.

Julie holds a BA in Communications from Augsburg College and an MBA in Marketing Research and Management from the University of St. Thomas.
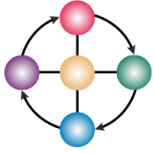
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